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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/588,510	01/25/2007	Hiroshi Nishimura	294723U/S3X PCT	2077
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OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314				
EXAMINER CHAET, MARISSA W				
ART UNIT		PAPER NUMBER		
1791				
NOTIFICATION DATE		DELIVERY MODE		
04/10/2008		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

patentdocket@oblon.com  
oblonpat@oblon.com  
jgardner@oblon.com

### Office Action Summary

**Application No.**

10/588,510

**Applicant(s)**

NISHIMURA ET AL.

**Examiner**

Marissa W. Chaet

**Art Unit**

1791

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12/31/08.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 and 3-7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 3-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 31 December 2007 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-8508)
- Paper No(s)/Mail Date \_\_\_\_\_

- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Inventor's Patent Application
- 6) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**1. Claims 1 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mizutani et al. (US 3817710).**

Regarding claim 1, Mizutani discloses a single-crystal growth apparatus which comprises spheroid mirror (23), heat source (21) located at one foci (F1) of the spheroid mirror, a feed rod (25) and a seed crystal rod (24) located at the other foci (F2) of the spheroid mirrors, a quartz tube (35) surrounding the feed rod and seed crystal rod, and shaft drive (34) means for rotating and vertically moving (38) crystal draft shafts respectively supporting the feed rod and seed crystal rod, and in which infrared rays of the heat sources are reflected by the spheroid mirrors to irradiate the feed rod and seed crystal rod located at the other foci, thereby growing the crystal, which the apparatus is characterized in that the minor axis/major axis ratio of the spheroid mirrors is 0.9 to 0.95. See Fig. 1-4; col. 1, line 30 – col. 6, line 70.

Furthermore, Mizutani discloses a total power of 1.5 kW, thereby making it possible to achieve heating performance of 2000°C.

However, Mizutani does not disclose more than one mirror, an interfocal distance of 41.1 to 67 mm, or a major axis of 57.7 to 80 mm and a minor axis of 52 to 76 mm. It

would have been obvious to one of ordinary skill in the art at the time of the invention to include more than one mirror and to modify the distance between the two foci in order to change the heat irradiating the feed rod and seed crystal rod.

2. **Claims 3-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mizutani et al. (US 3817710) in view of Mizutani et al. (US 3761677).**

3. Regarding claim 3, Mizutani '710 does not disclose bi-spheroid mirrors. However, Mizutani '677 discloses bi-spheroid mirrors (1, 1'). Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to include bi-spheroid mirrors, such as suggested by Mizutani '677, to increase the reflecting surface.

4. Regarding claim 4, Mizutani '710 discloses an air-cooling unit (36) for introducing cooling gas for cooling the spheroid mirror, a heat source (21), and a flow rate of 2.5 L/s, or 0.15 m<sup>3</sup>/min. See col. 4, lines 13-17.

Regarding claim 6, Mizutani '710 discloses a cooling water heat exhaust system, where halogen lights (radiator) raise the temperature of the mirror, cooling water is supplied to cool to mirror, and cooling air is supplied by an exhaust pipe. See col. 4, lines 17-63.

However, Mizutani '710 does not disclose internal water-cooling jackets or heat insertion holes. Mizutani '677 discloses internal water-cooling jackets (61, 61') and heat insertion holes (4). Thus, it would have been obvious to one of ordinary skill in the art at the time of the invention to include water-cooling jackets and heat insertion holes, such as suggested by Mizutani '677, to cool the spheroid mirrors and to insert the heating source, respectively. Furthermore, it would have been obvious to one of ordinary skill in

the art at the time of the invention that the apparatus is capable of cooling the spheroid mirrors at a flow rate of 1.2 to 2.3 m<sup>3</sup>/min. Lastly, it would have been obvious to one of ordinary skill in the art at the time of the invention that the air flow could become turbulent in the inner space of the spheroid mirrors when the air is flowing at a rate of 1.2 to 2.3 m<sup>3</sup>/min.

### ***Response to Arguments***

Applicant's arguments filed December 31, 2007 have been fully considered but they are not persuasive.

Applicant argued that Mizutani '710 does not disclose a total power of 1500W for a heating performance of 2000°C. However, Mizutani '710 does disclose a total power of 15000W and heating a crystal zone to over 1500°C. See col. 3, lines 4-5.

Applicant argued that it is not obvious to add another mirror to Mizutani '710. Examiner disagrees with this assertion and maintains that it is obvious, as stated above.

Overall, the single-crystal growth apparatuses as disclosed in both Mizutani references are capable of performing the tasks at hand in the instant invention.

### ***Conclusion***

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Marissa W. Chaet whose telephone number is 571-272-8094. The examiner can normally be reached on Monday-Friday 8:30am-5:00pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina A. Johnson can be reached on 571-272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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April 1, 2008

/Robert M Kunemund/

Primary Examiner, Art Unit 1792